

PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

A New or Improved Composite Sheet Material.

I, CHARLES KELWAY BAMBER, a British Subject, of 9, Victoria Street, Westminster, London, S.W. 1, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a composite or laminated sheet material of the kind comprising a ply or veneer of wood and a ply, layer or backing, or it may be plies or layers, of wood or other material or composition such, for example, as millboard, and has for its object an improved material of that character.

Plywood is well known and widely used for various purposes, such for example as panelling for vehicles, and as bottoms and backs of seats. It has been found that when plywood prepared in the usual manner is exposed alternately to moisture-laden atmosphere and to dry and warm air the plies tend to separate and an outer ply or veneer will split and become detached from the remaining plies of the sheet. Veneered boards and veneered sheets of millboard and other compositions also are known, and when the veneer is exposed to moisture-laden atmosphere and to dry and warm air alternately trouble is experienced owing to the veneer splitting and becoming detached from its backing.

Further when plywood as heretofore manufactured is used in panelling on vehicles such for example as railway coaches the panels have a natural resonance and a drumming effect obtains during the running of the vehicle.

It is an object of the present invention to provide a composite sheet material comprising plies of wood, or a ply or veneer of wood and a backing, which shall be such that, notwithstanding saturation of an outer ply or veneer of the sheet, or both outer plies, with moisture and subsequent drying by heated air, the said ply or plies or the veneer will not become separated from the backing or other plies of the sheet.

A further object of the invention is to provide a composite sheet material which,

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in addition to having the advantageous characteristic stated in the preceding paragraph, shall be such that, when used for panelling and the like it will be free from the objectionable drumming above referred to.

It has been proposed in the Specification of Letters Patent No. 380,230 to form a floor covering of one or two wood veneers mounted on a cork composition base, with the grain of one veneer at an angle to that of the other, when two veneers are provided, the said veneers being secured together, and one veneer being secured to the base by applying to the base and veneer or veneers a film of ammonia preserved rubber latex constituted by one or more coatings, and when the latex has set, bringing the coated faces together and applying a light pressure to effect adhesion.

It has also been proposed in the Specification of Letters Patent No. 190,031 to produce a composite laminated structure by impregnating a ply or plies of wood with a rubber solvent, assembling the ply or plies of wood alternately with a ply or plies of uncured or semi-cured rubber, alternate wood plies having the grain extending non-parallel and subjecting the assembled plies to pressure and heat so that the uncured or semi-cured rubber is partially absorbed by the impregnating solvent with the object that the rubber constituent of the bonding plies should be carried into and intimately incorporated in the wood plies to obtain a bond between the wood and bonding plies more intimate than a superficial one.

The invention consists primarily in a method of manufacturing composite or laminated sheet material comprising the steps of treating the opposing surfaces of a ply or veneer of wood, and a ply, layer or backing of wood, millboard or other appropriate material, and both surfaces of a ply of thin sheet rubber, with rubber latex, exposing such treated surfaces to air at atmospheric or higher temperature until the rubber latex applied thereto becomes tacky, placing the treated surfaces together with the sheet rubber ply inter-

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posed between the other plies or layers, and applying light pressure to the superposed plies to expel air from between them and ensure contact, throughout the whole area, between the films of rubber constituted by the latex deposited on such surfaces.

Other manufacturing steps which may be employed in carrying the invention into practice will be pointed out in the claims and referred to hereinafter, and it will be appreciated that the invention, in addition to consisting in the method of manufacturing composite or laminated material, extends also to material manufactured by the said method.

In the manufacture of the improved material according to this invention the surfaces of the plies or veneers of wood or other material, and sheet rubber, which lie next to one another in the completed product are treated as by brushing or spraying with rubber latex. The surfaces so treated are exposed to air for a suitable period of time until a tacky film of rubber obtains on such surfaces. The air may be at atmospheric temperature or above atmospheric temperature as may be desired. When the film of rubber on the surfaces of the plies has become suitably tacky the sheets are placed together and relatively light pressure applied. If desired, the sheets may be passed between rollers which may or may not be heated. The material is then allowed to stand for a suitable time until the rubber has become vulcanised or oxydised, when it will be found that the plies or layers will remain firmly adhered to one another.

Laminated material prepared in the manner just described is such that, although the outer layer, ply or veneer, or outer layers, plies or veneers of wood, may be saturated with moisture and may subsequently be dried adherence will be maintained.

If desired, in order to assist or ensure vulcanisation of the rubber layer or film, finely powdered sulphur may be blown or otherwise dusted on to the surfaces of the plies when tacky before such plies are placed together, or an appropriate quantity of sulphur may be mixed with the latex which is to be employed for treating the surfaces in question.

As already indicated, according to the invention there is interposed between wood plies, or between a veneer and a backing, an india-rubber sheet. This india-rubber sheet may be vulcanised or not as desired, and its surfaces are treated with latex and exposed to air until the latex becomes tacky. In manufacturing

a plywood with interposed rubber sheets the wood plies alternate with the rubber sheets the alternate plies of wood, however, having their grain crossed as in plywood prepared in the usual manner.

As has been mentioned, it is within the invention to use a sheet of vulcanised india-rubber. The sheet may be such that it has a free sulphur content, the sulphur ensuring or assisting vulcanisation of the rubber content of the latex employed for treating the surfaces of the laminations.

Where the material comprises three or more plies of wood with interposed rubber sheets, and the internal woodply or plies are relatively thin, the said internal ply or plies may be formed, if desired, with perforations appropriately disposed about the ply or plies whereby when in the course of manufacture the layers of the composite sheet are pressed together the layers of india-rubber on opposite sides of a perforated ply of wood will be pressed together and adhere to one another, thus firmly locking the internal ply or plies of wood and the rubber sheets together.

Owing to the interposition between the plies of wood or between the veneer and its backing of the india-rubber sheeting a small amount of linear movement of one wood ply in relation to another wood ply, or of the veneer in relation to its backing, may take place due to expansions or contractions of the wood or veneer without affecting the adhesion of the constituent plies of the composite sheet material.

It is to be understood that the interposed rubber sheeting employed may be of any desired thickness, but in securing a veneer to a backing, whether such backing be a relatively thick board, plywood, or a composition sheet, a very thin or wafer-like rubber sheet will be employed in order that a minimum thickness of resilient substance may obtain between the veneer and its backing, or in other words that the veneer may lie as close as possible to its more or less solid or rigid backing, whereby the liability of damage to the veneer by local pressure in the direction of its backing will be avoided or reduced to a minimum.

In the manufacture of laminated material according to this invention, internal plies, whether wood or sheet rubber, which have to be treated or coated on both sides with the latex, may be treated by dipping such plies in the latex and suspending them to allow the surplus liquid to drain off instead of applying the liquid by brushing or spraying.

Composite sheet material according to this invention may be employed for a

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large variety of purposes, the uses mentioned above being given merely by way of example.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. The method of manufacturing composite or laminated sheet material comprising the steps of treating the opposing surfaces of a ply or veneer of wood, and a ply, layer or backing of wood, mill-board or other appropriate material, and both surfaces of a ply of thin sheet rubber, with rubber latex, exposing such treated surfaces to air at atmospheric or higher temperature until the rubber latex applied thereto becomes tacky, placing the treated surfaces together with the sheet rubber ply interposed between the other plies or layers, and applying light pressure to the superposed plies to expel air from between them and ensure contact, throughout the whole area, between the films of rubber constituted by the latex deposited on such surfaces.

2. The method of manufacturing composite or laminated material as claimed in claim 1, and comprising the step of dusting the surfaces treated with latex whilst tacky with finely powdered sulphur, it may be by blowing such powder on to the said surfaces, in order that vulcanisation

of the latex may be effected after the treated surfaces have been placed together.

3. The method of manufacturing composite or laminated material as claimed in claim 1 or in claim 2, characterised in that the sheet rubber ply, or each of such plies, is a vulcanised sheet having a free sulphur content, the sulphur ensuring or assisting vulcanisation of the rubber content in the latex.

4. A composite or laminated sheet material manufactured by the method claimed in any preceding claim, wherein an internal wood ply has perforations appropriately disposed over its area, whereby when the superposed plies are pressed together the plies of sheet rubber lying on either side of the wood ply will be pressed into contact through said perforations and by their adherence to one another lock the rubber sheets and the said ply together.

5. The herein described method of manufacturing composite or laminated sheet material.

6. Composite or laminated sheet material manufactured substantially as described.

Dated this 20th day of March, 1933.

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